

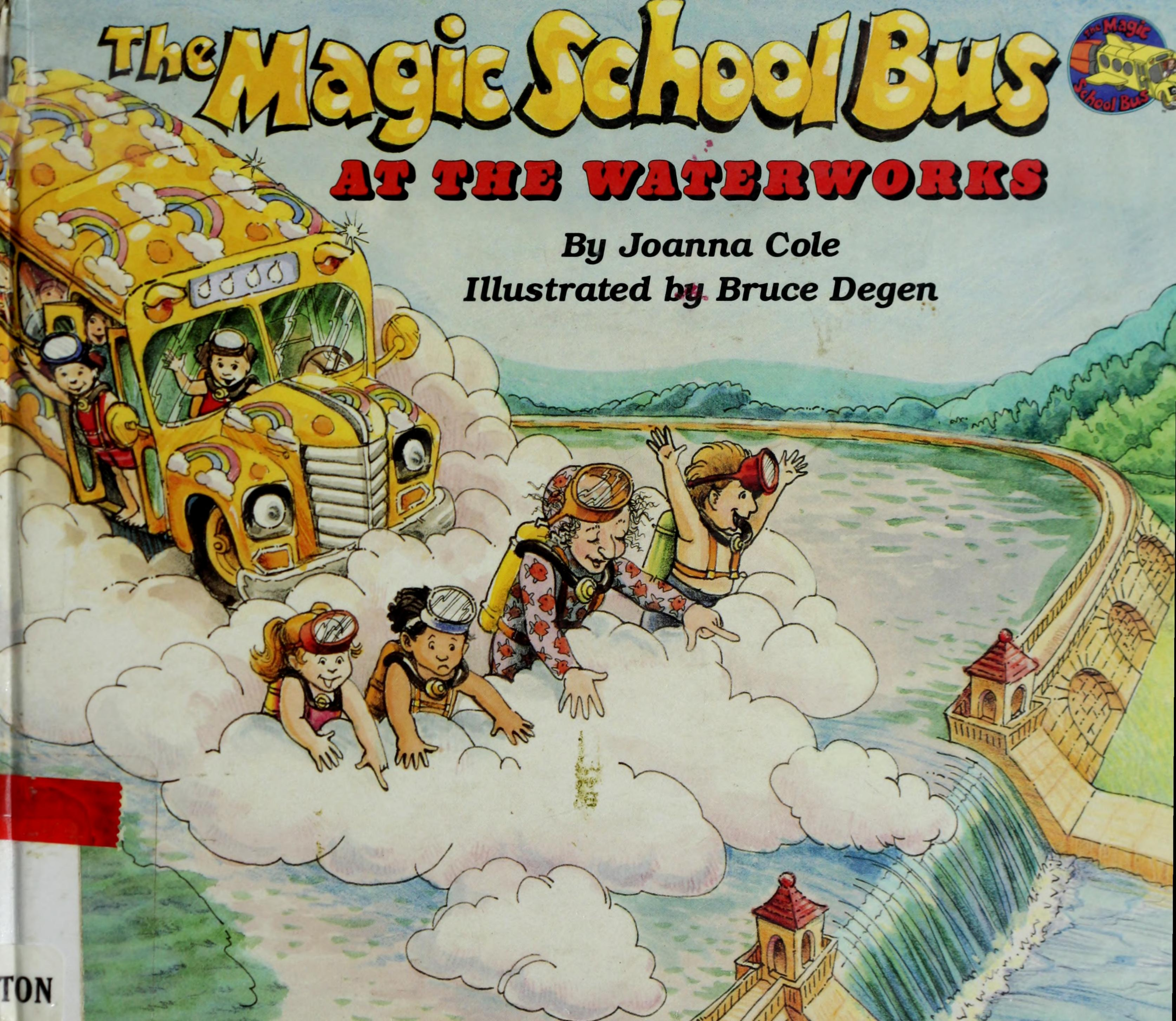
The Magic School Bus

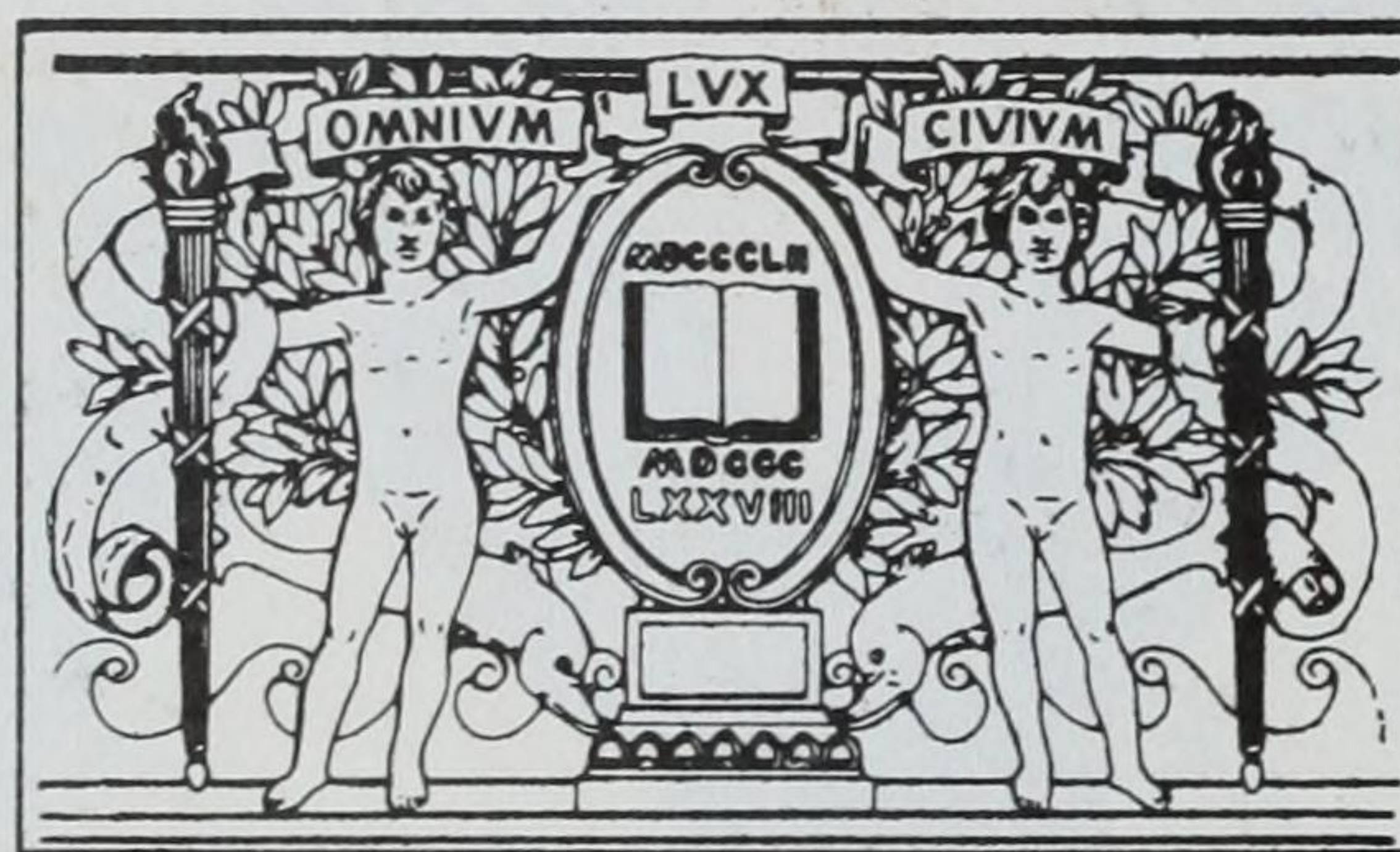


AT THE WATERWORKS

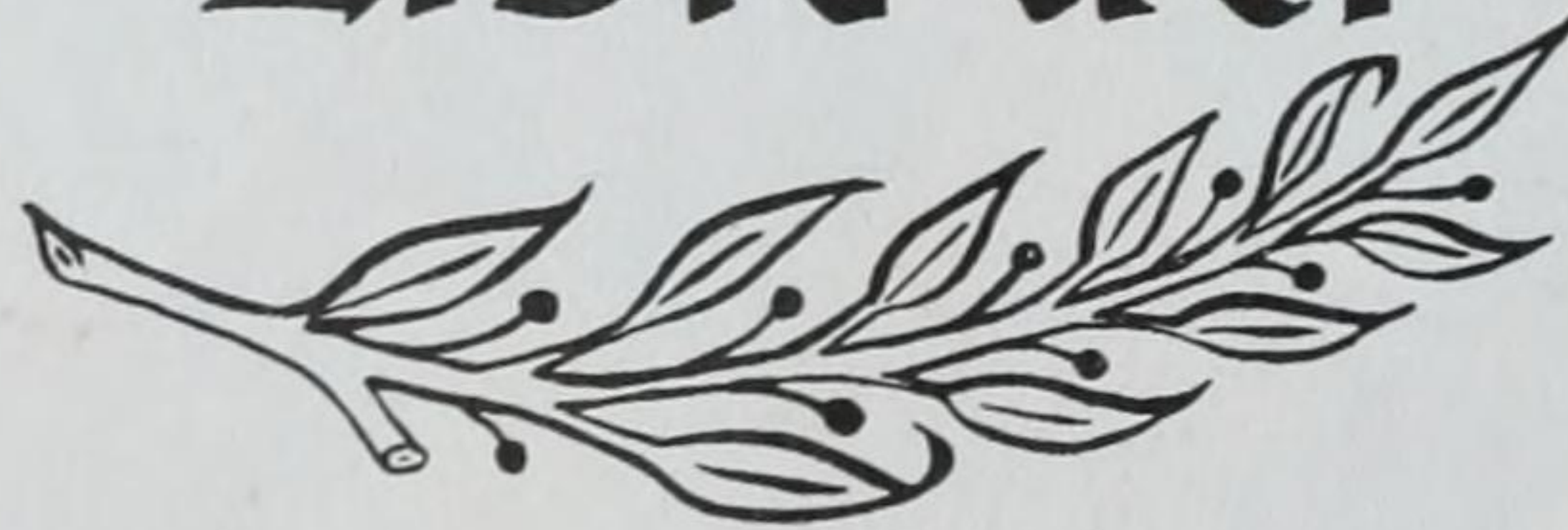
By Joanna Cole

Illustrated by Bruce Degen





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The Magic School Bus
At the Waterworks





The Magic School Bus *At the Waterworks*

By Joanna Cole

Illustrated by Bruce Degen



SCHOLASTIC INC. / New York

*The author and illustrator wish to thank Nancy Zeilig and
the technical services staff at American Water Works Association,
Denver, Colorado, for their help in preparing this book.*

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The magic school bus.

Summary: When Ms. Frizzle, the strangest teacher
in school, takes her class on a field trip to the
waterworks, everyone ends up experiencing the water
purification system from the inside.

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To Rachel

J.C.



*For Uncle Jerry,
the Water Chemist*

B.D.





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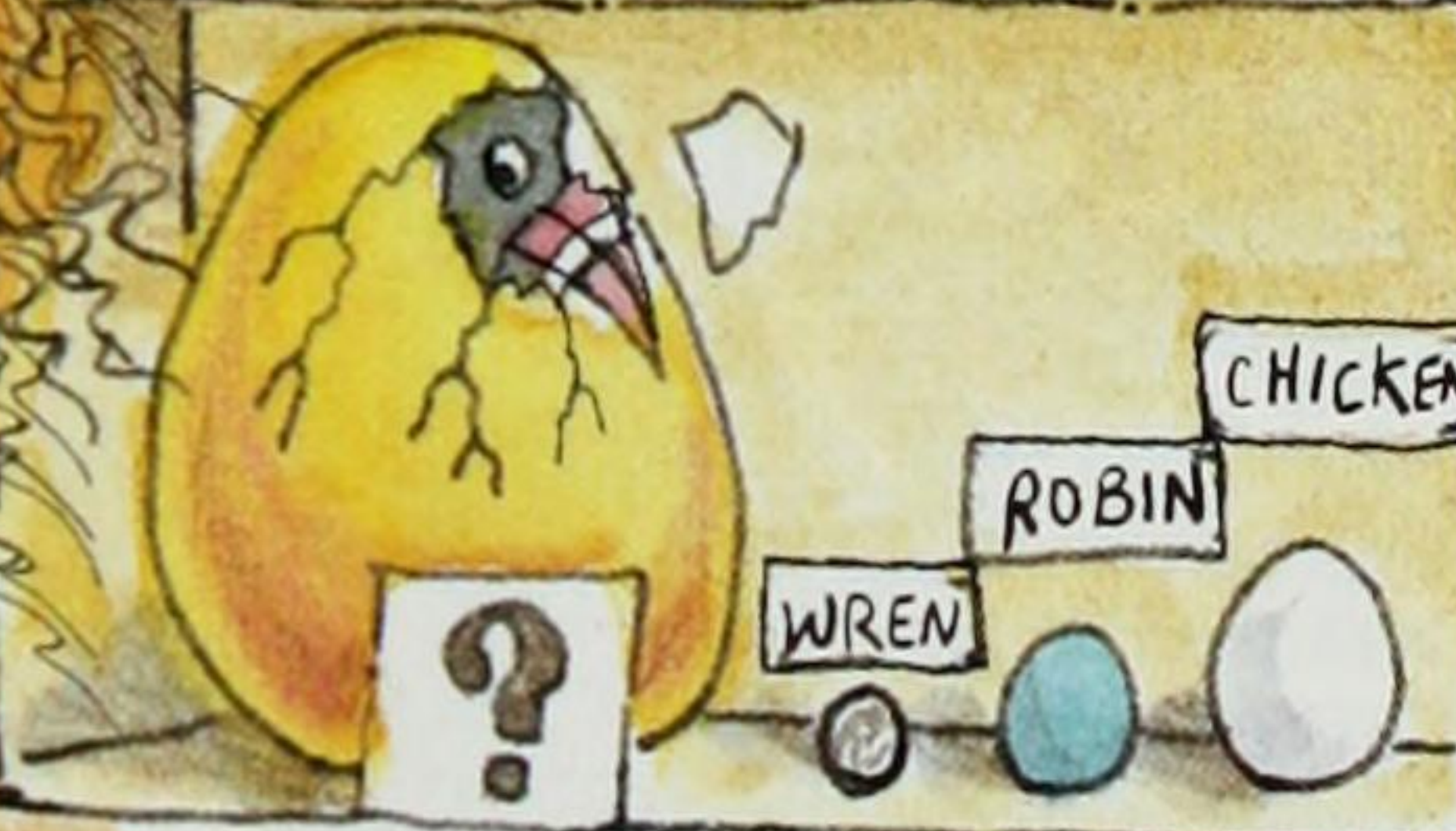
Our class really has bad luck.
This year, we got Ms. Frizzle,
the strangest teacher in school.

We don't mind Ms. Frizzle's strange dresses.
Or her strange shoes.
It's the way she acts that really gets us.
Ms. Frizzle makes us grow green mold
on old pieces of bread.
She makes us build clay models of garbage dumps,
draw diagrams of plants and animals,
and read five science books a week.

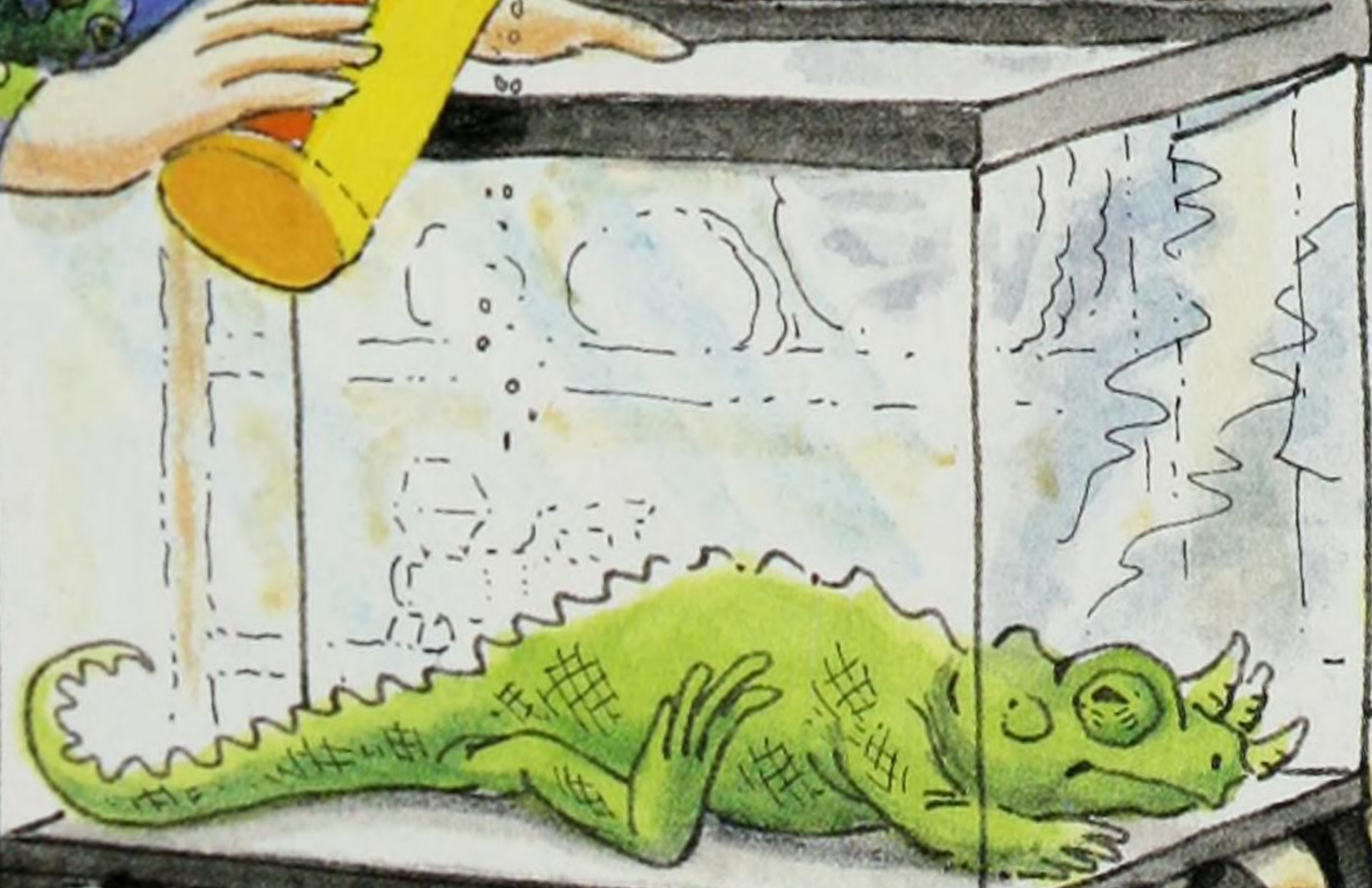


Shell Collection

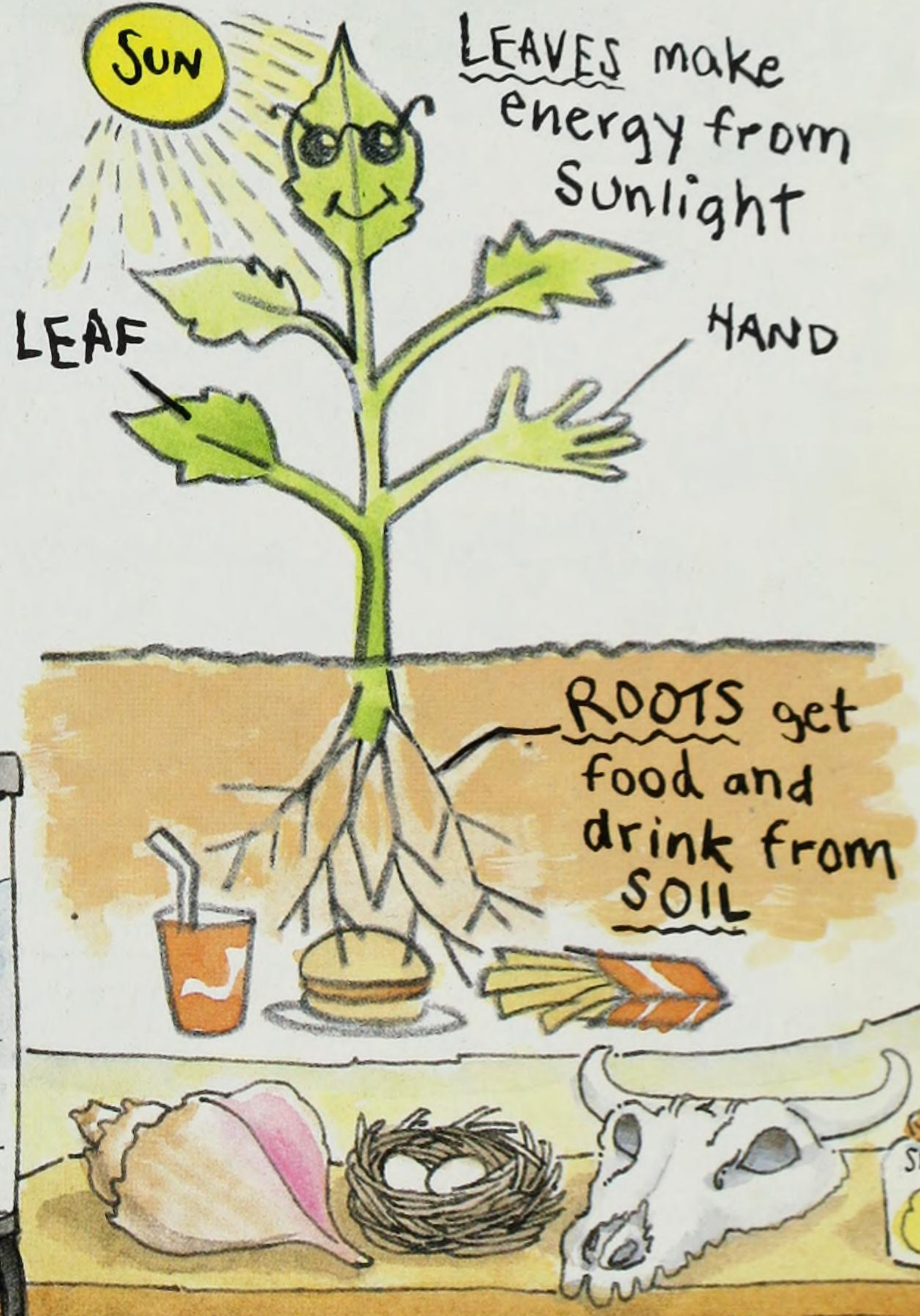
DOWN,
LIZ.



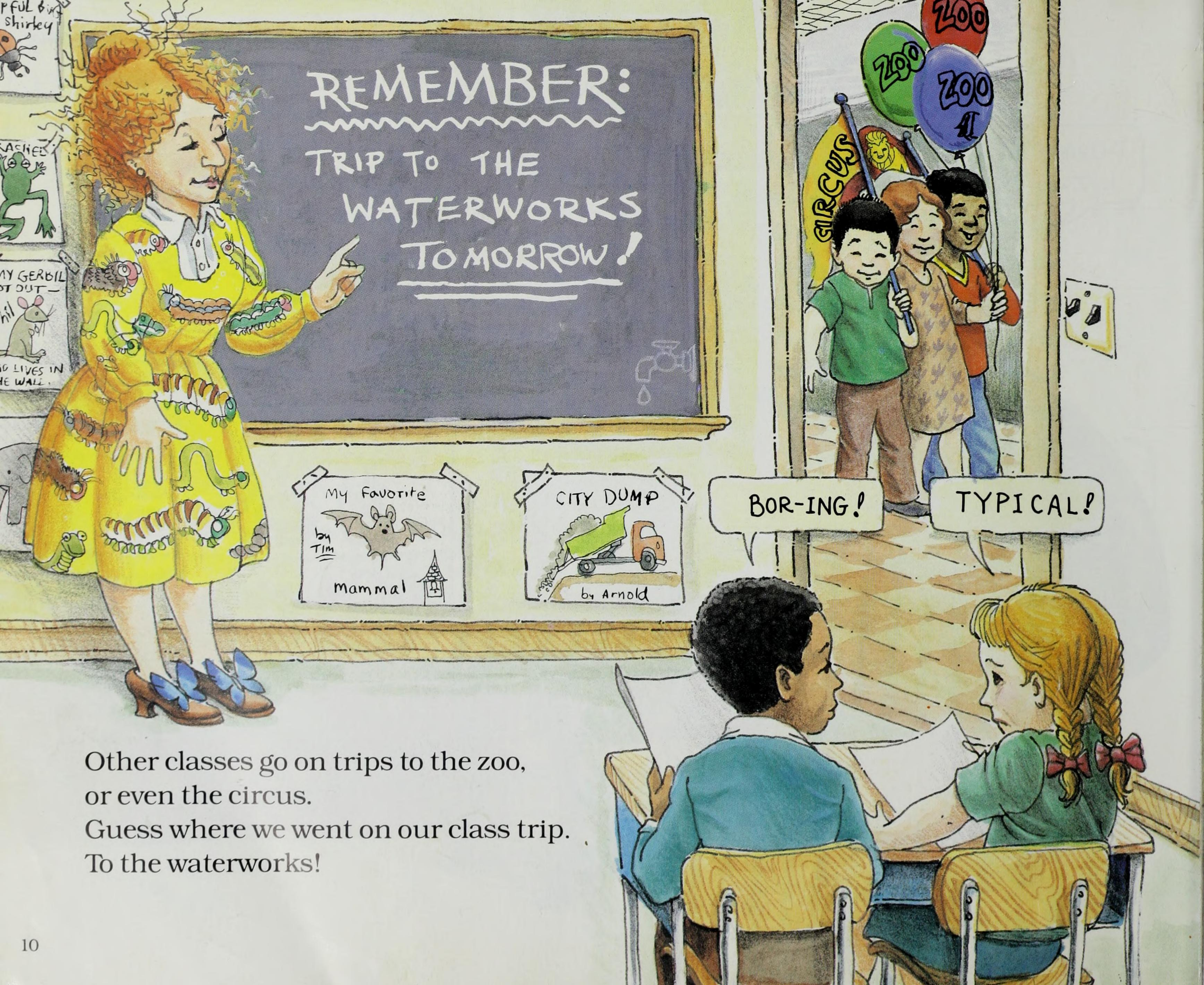
ROCKS AND MINERALS



Parts of a Plant by Gregory



BUTTER FLIES
BEETLES



REMEMBER:
TRIP TO THE
WATERWORKS
TOMORROW!

My Favorite



by Tim
Mammal

CITY DUMP



by Arnold

BOR-ING!

TYPICAL!

Other classes go on trips to the zoo,
or even the circus.
Guess where we went on our class trip.
To the waterworks!

And to get ready for the trip, Ms. Frizzle made us spend a whole month in the library. We had to find out exactly how our city gets its water — down to the last drop. We also had to collect ten interesting facts about water.

I DON'T THINK THERE ARE TEN INTERESTING FACTS ABOUT WATER.

MAYBE FOUR AND A HALF.

WATER FACT #1
by Wanda

About $\frac{2}{3}$ of
your body is
made up of
water.



• Water Fact #2
by Tim

Water is the only substance that is found in the form of a liquid, a solid, and a gas in nature.

• LIQUID (WATER)

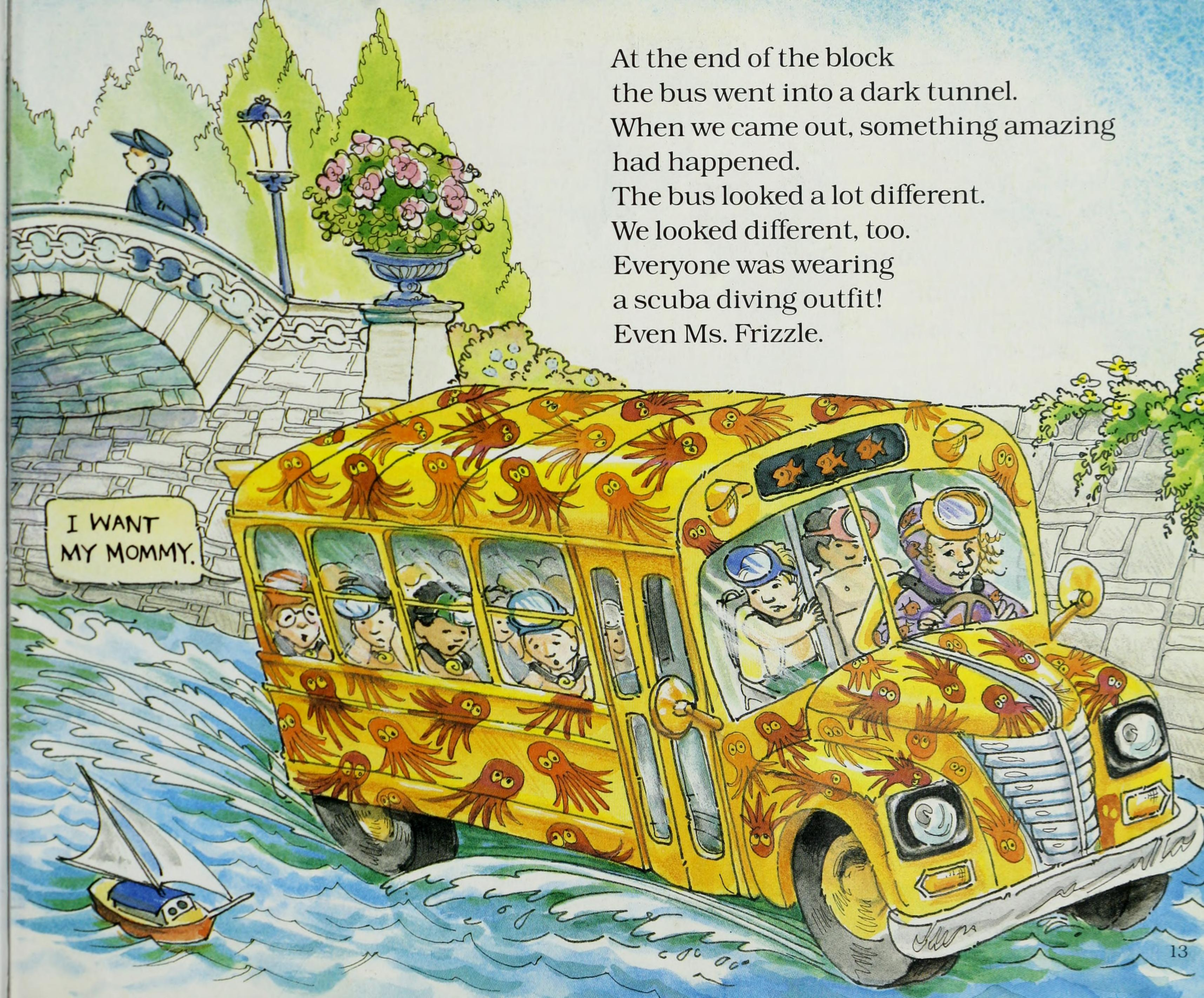
• SOLID (ICE)

• GAS (WATER VAPOR)



In the parking lot,
the old school bus was waiting.
To our surprise,
there was no bus driver.
Instead, The Friz herself
was behind the wheel.

At the end of the block
the bus went into a dark tunnel.
When we came out, something amazing
had happened.
The bus looked a lot different.
We looked different, too.
Everyone was wearing
a scuba diving outfit!
Even Ms. Frizzle.



WATER FACT #3

by Shirley

There is water in the air you are breathing. You can't see it, because it is in the form of an invisible gas called water vapor.

When water evaporates, it changes from a liquid to a gas and rises into the air.

I DIDN'T
KNOW THAT!



WE'RE GOING UP!

Ms. Frizzle was the only one who didn't seem to notice the change. She just drove on. In the middle of a bridge, the bus started ...



to rise into ...

AS YOU KNOW, CLASS,
WATER IS ALWAYS
EVAPORATING FROM
LAKES, RIVERS, STREAMS,
AND OCEANS.

ARNOLD, ARE YOU
PAYING ATTENTION?

I KNEW
I SHOULD HAVE
STAYED HOME
TODAY.

I WANT MY MOMMY!

YOU SAID
THAT ALREADY.



the air.



It went right up...



into a cloud.

Then Ms. Frizzle did the weirdest thing ever. She told everybody to get out of the bus! The kids didn't want to go. But Frizzie threatened to give extra homework if we didn't.



Some kids stuck their heads out of the cloud and looked down. There were mountains down there! And the cloud was going higher every minute.



It was getting colder, too.
All around us,
drops of water began to form.
And as the drops got bigger,
we got smaller!

WATER FACT #4
by FLORRIE

Clouds are water.
The higher up you go,
the colder the air is.
When water vapor
rises, the cold air
makes the vapor form
droplets, which hang
in the air as a mist.
This is a cloud.

HELP! WE'RE
SHRINKING!

I WAS ALREADY
SMALL
FOR MY AGE.



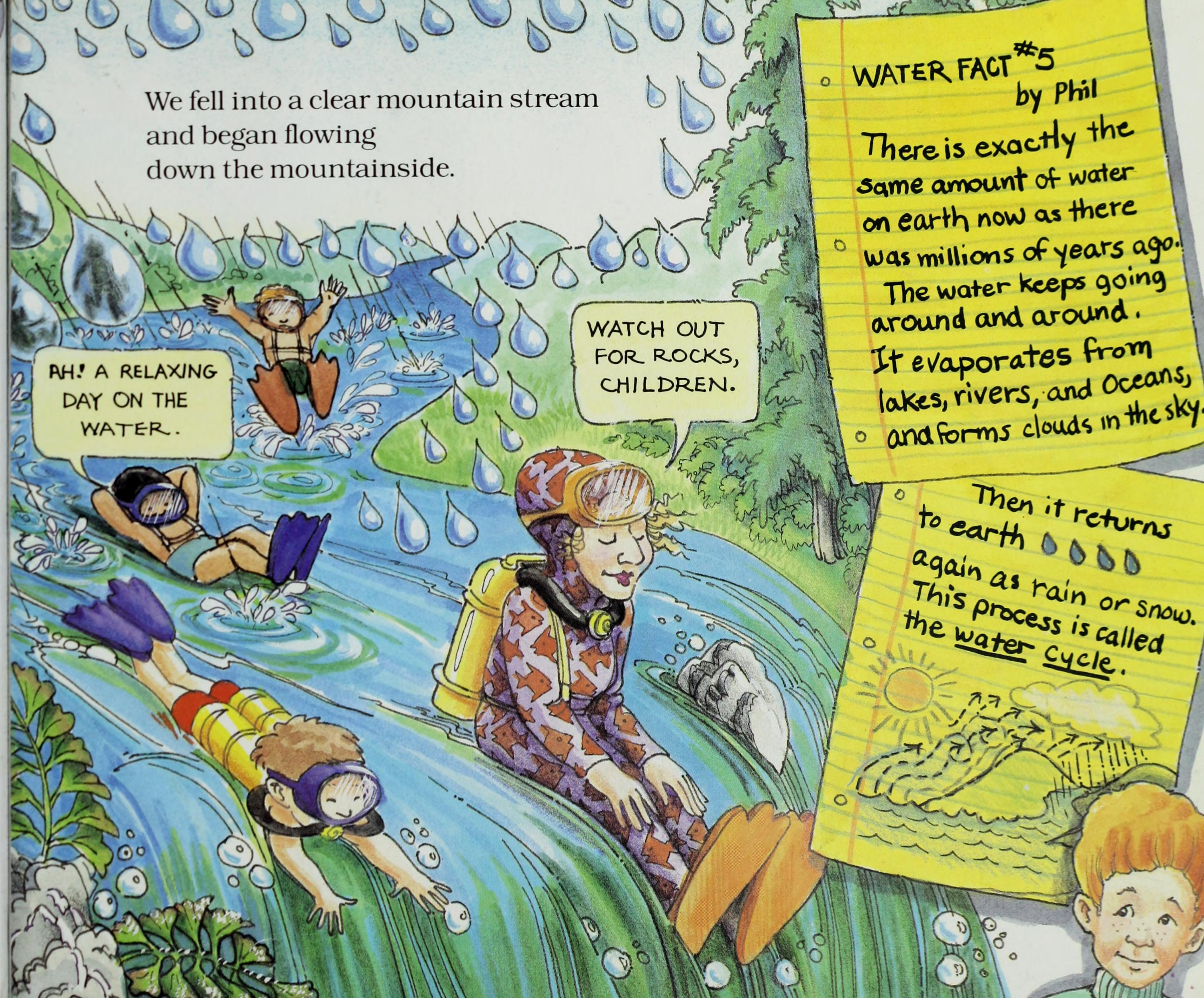
Before long, each kid was
the size of a raindrop.
In fact, each kid was
in a raindrop.
The drops began to fall.
Ms. Frizzle's class was raining!



STAY TOGETHER,
CHILDREN.

IT'S A GOOD
THING I BROUGHT
MY UMBRELLA.

EEEEEE!



We fell into a clear mountain stream
and began flowing
down the mountainside.

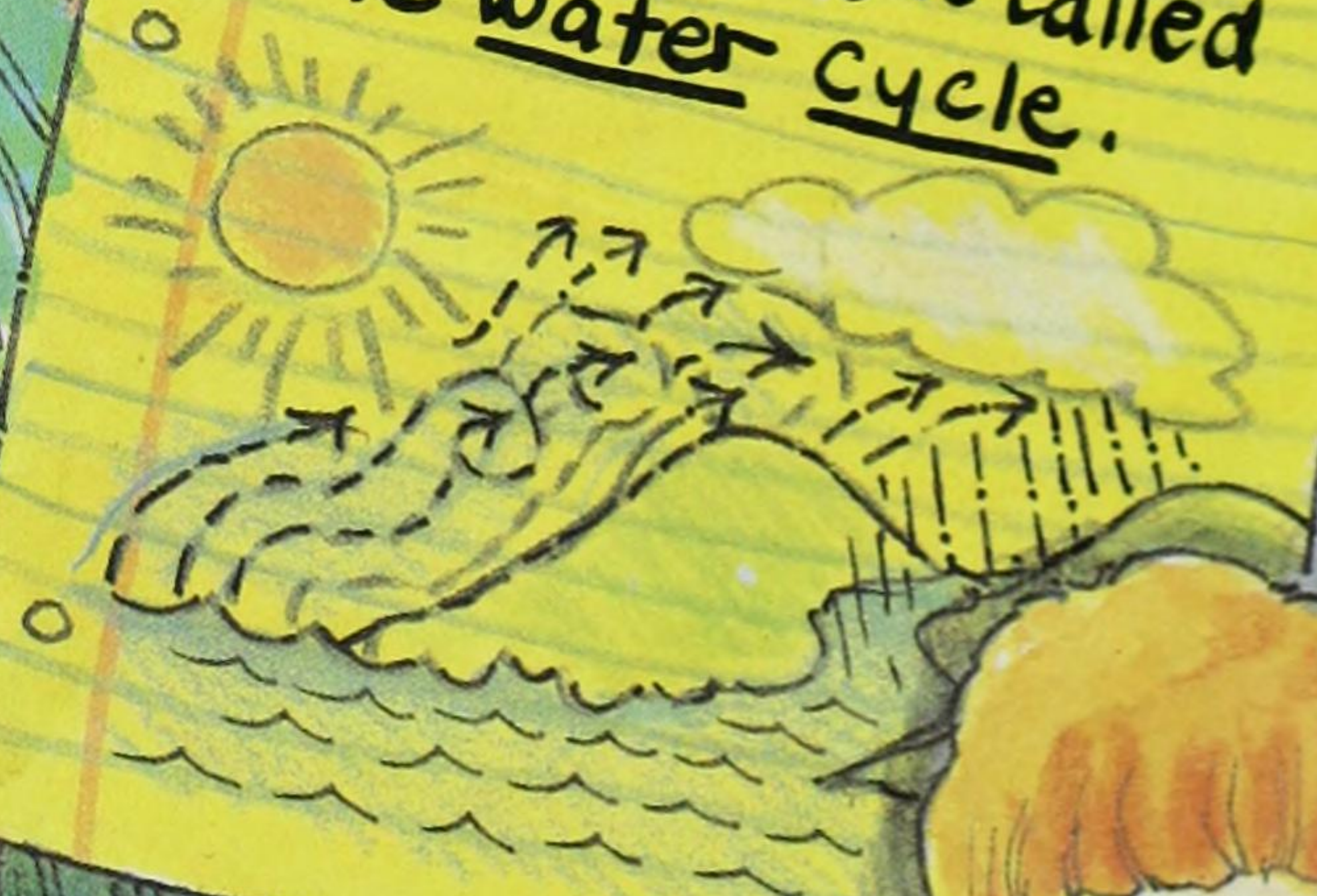
PH! A RELAXING
DAY ON THE
WATER.

WATCH OUT
FOR ROCKS,
CHILDREN.

WATER FACT #5 by Phil

There is exactly the
same amount of water
on earth now as there
was millions of years ago.
The water keeps going
around and around.
It evaporates from
lakes, rivers, and oceans,
and forms clouds in the sky.

Then it returns
to earth
again as rain or snow.
This process is called
the water cycle.



In no time, we reached
the reservoir
that holds water
for our city.
We were going into
the water purification system.
This class trip was
not so boring after all!


EVERGREEN TREES KEEP DUST
AND LEAVES FROM BLOWING
INTO THE RESERVOIR.

FENCE KEEPS PEOPLE
AND ANIMALS FROM
DIRTYING THE RESERVOIR.


THIS IS GREAT!

WHAT'S THAT?





INSPECTOR MAKES SURE
NO SEWAGE SEEPS
IN FROM NEARBY
HOUSES.

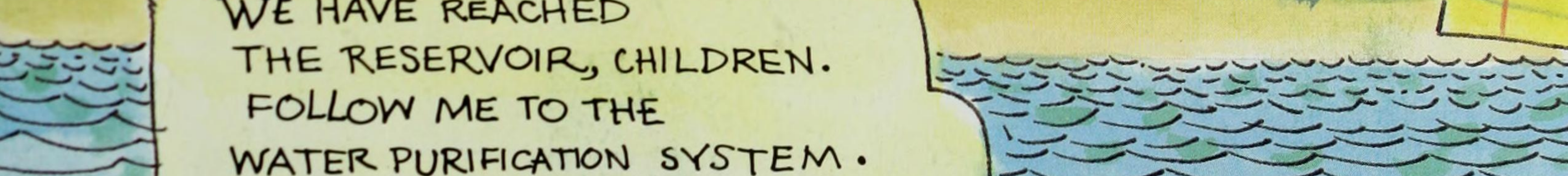


INSPECTOR MAKES SURE
NO TOXIC WASTES
ARE DUMPED NEARBY.

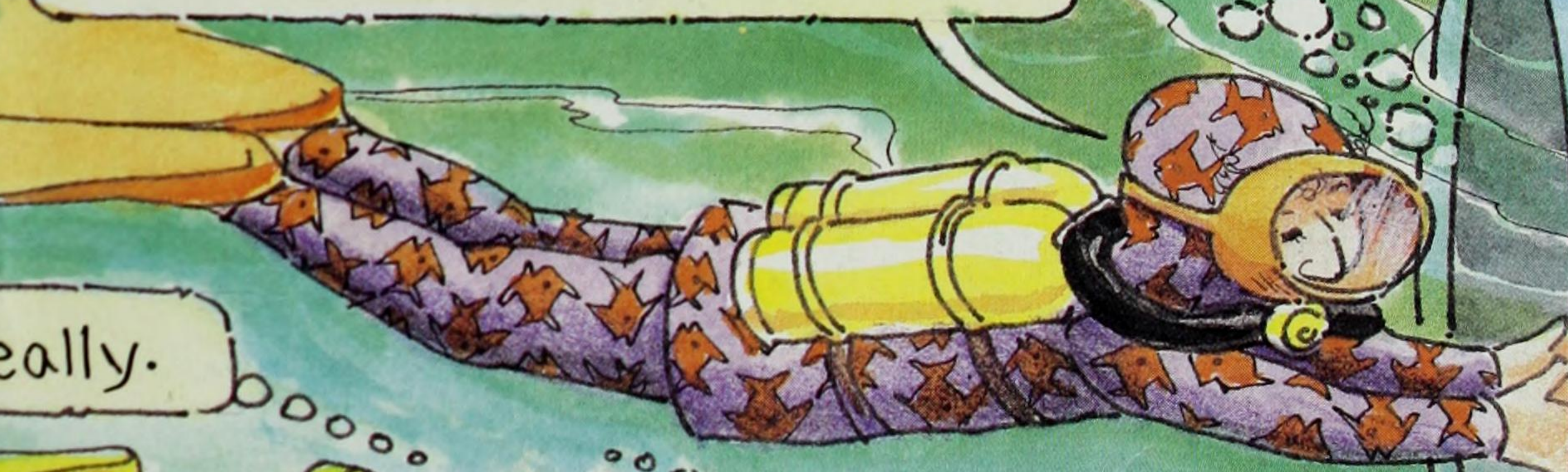
SOME WATER WORDS by Dorothy Ann

A reservoir is a
place where water is
stored.


When you purify water
you clean it.



WE HAVE REACHED
THE RESERVOIR, CHILDREN.
FOLLOW ME TO THE
WATER PURIFICATION SYSTEM.



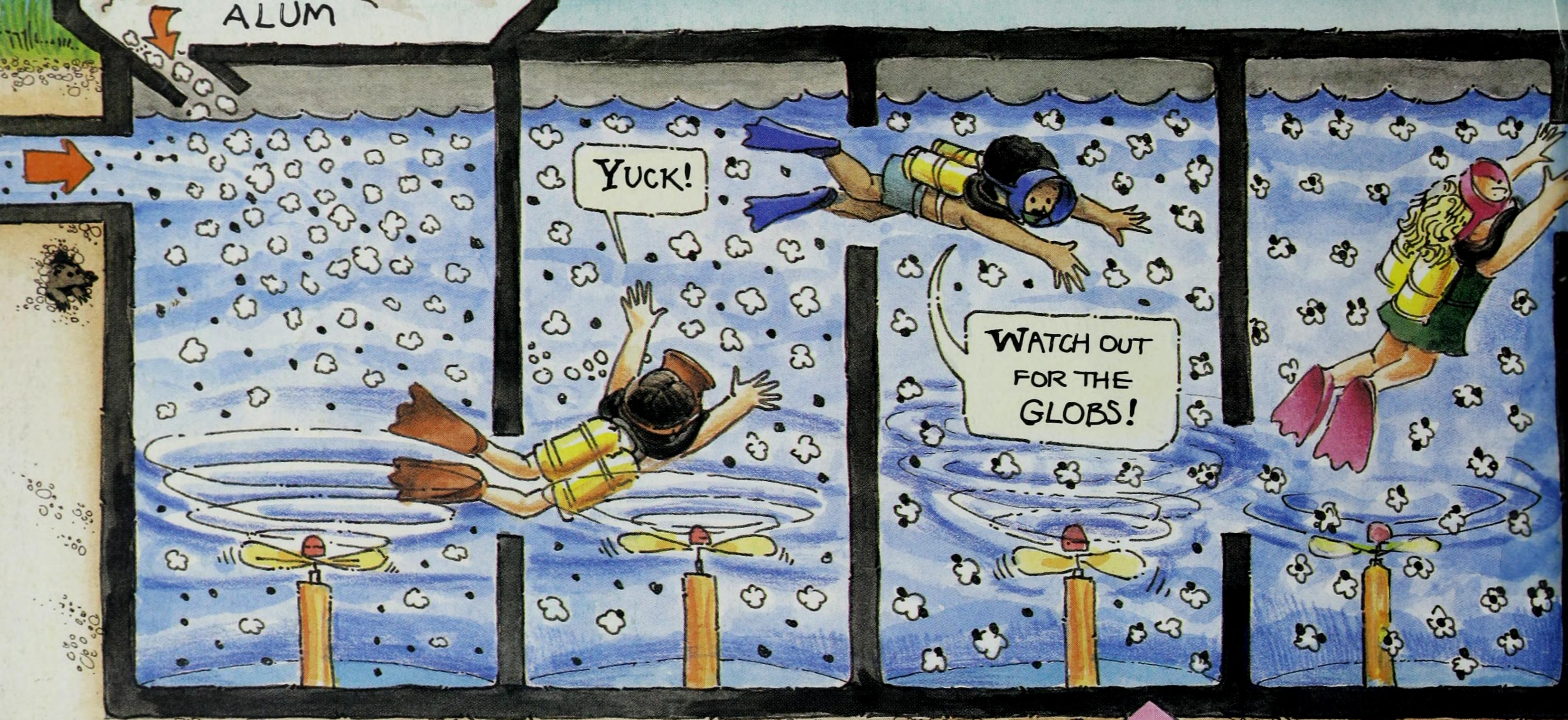
ARE YOU LISTENING, ARNOLD?



Not really.



DICTIONARY



The water in the reservoir was pretty dirty.

We were covered with dirt and mud.

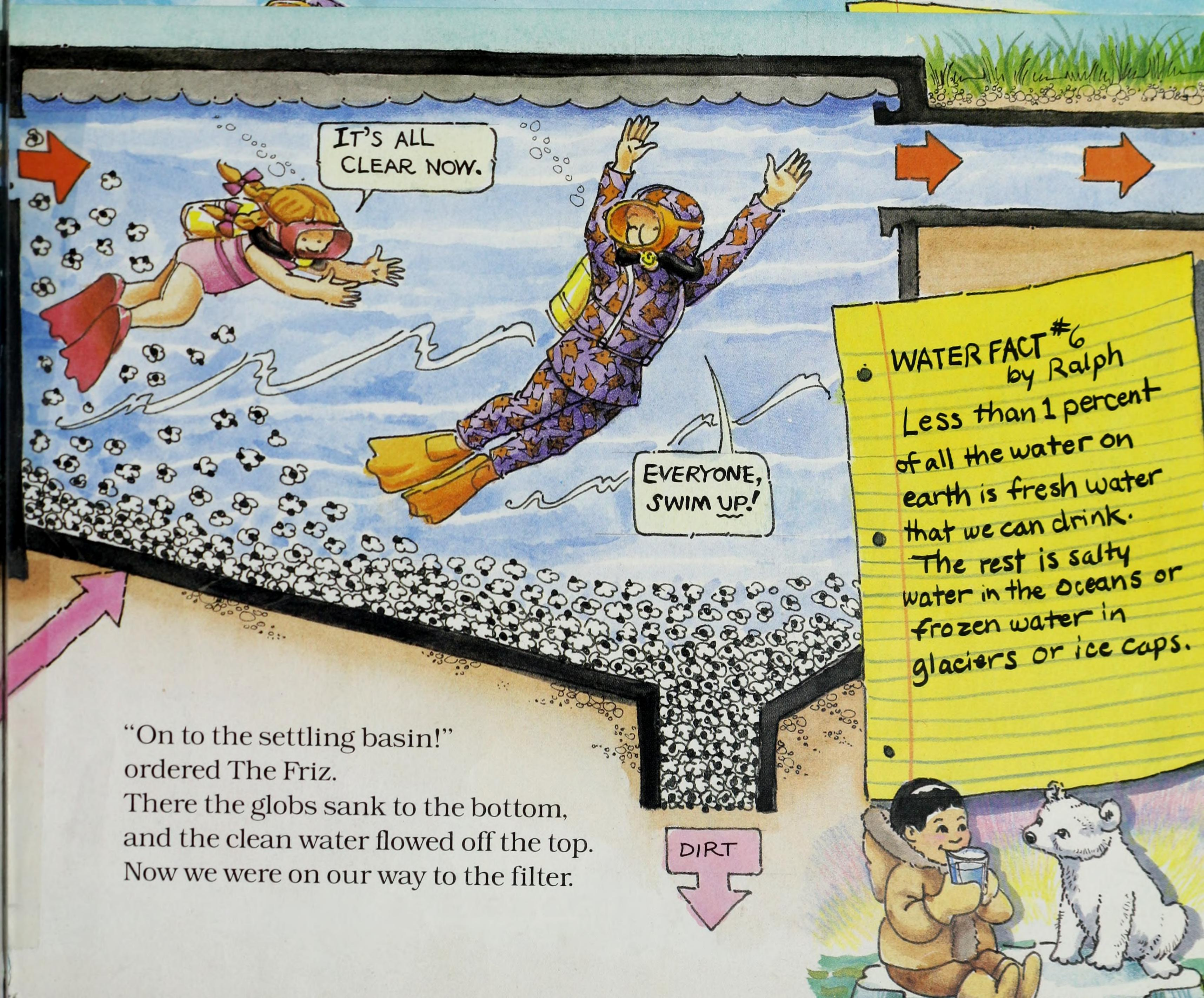
“Follow me to the mixing basin,” shouted Ms. Frizzle.

In the mixing basin, a clumping substance called alum was added to the water.

The alum formed globs, and all the dirt and mud stuck to the globs.

MIXING BASIN

SETTLING BASIN



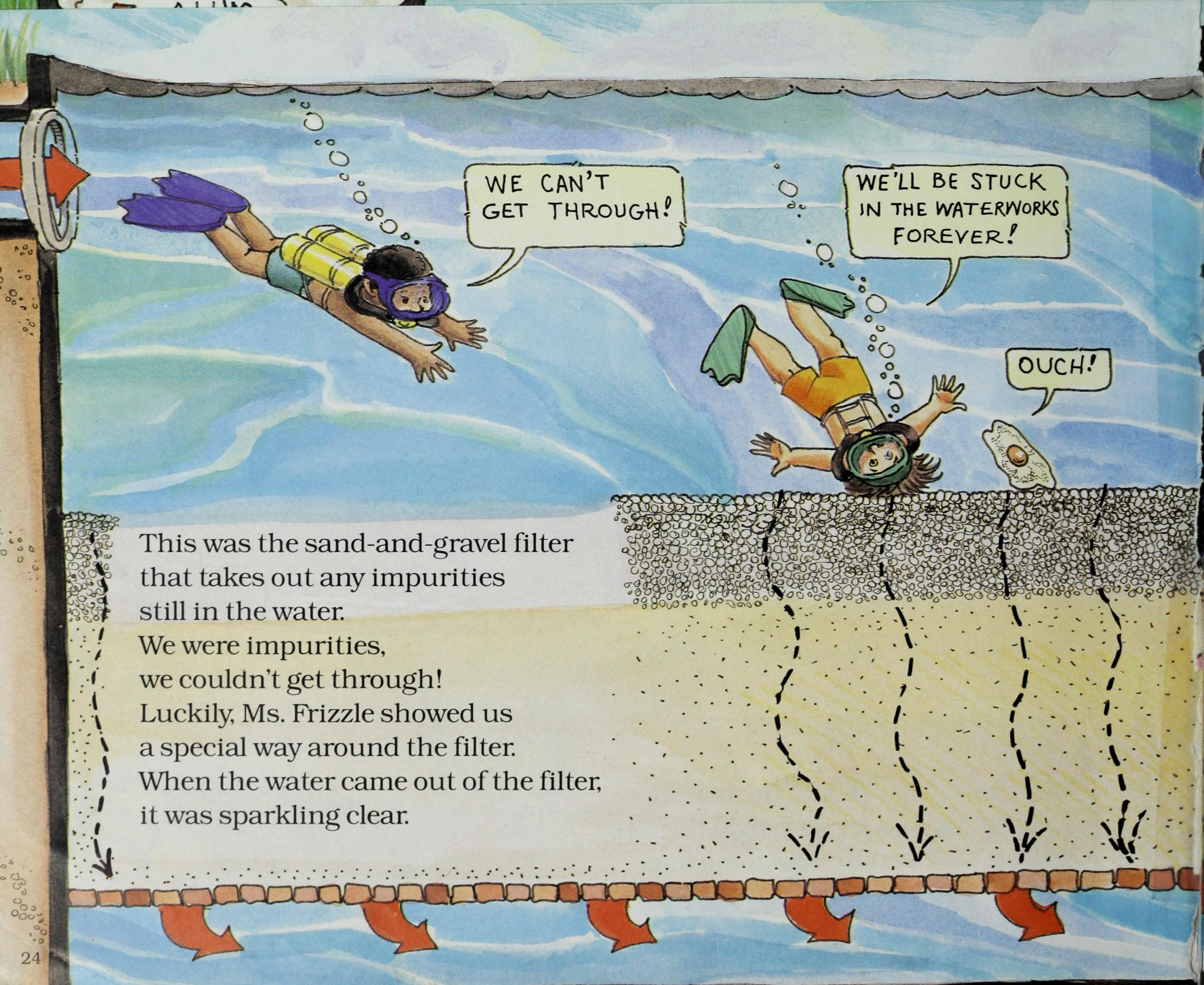
IT'S ALL
CLEAR NOW.

EVERYONE,
SWIM UP!

- WATER FACT #6
by Ralph
- Less than 1 percent
of all the water on
earth is fresh water
that we can drink.
- The rest is salty
water in the oceans or
frozen water in
glaciers or ice caps.

“On to the settling basin!”
ordered The Friz.
There the globs sank to the bottom,
and the clean water flowed off the top.
Now we were on our way to the filter.

DIRT



WE CAN'T
GET THROUGH!

WE'LL BE STUCK
IN THE WATERWORKS
FOREVER!

OUCH!

This was the sand-and-gravel filter
that takes out any impurities
still in the water.
We were impurities,
we couldn't get through!
Luckily, Ms. Frizzle showed us
a special way around the filter.
When the water came out of the filter,
it was sparkling clear.



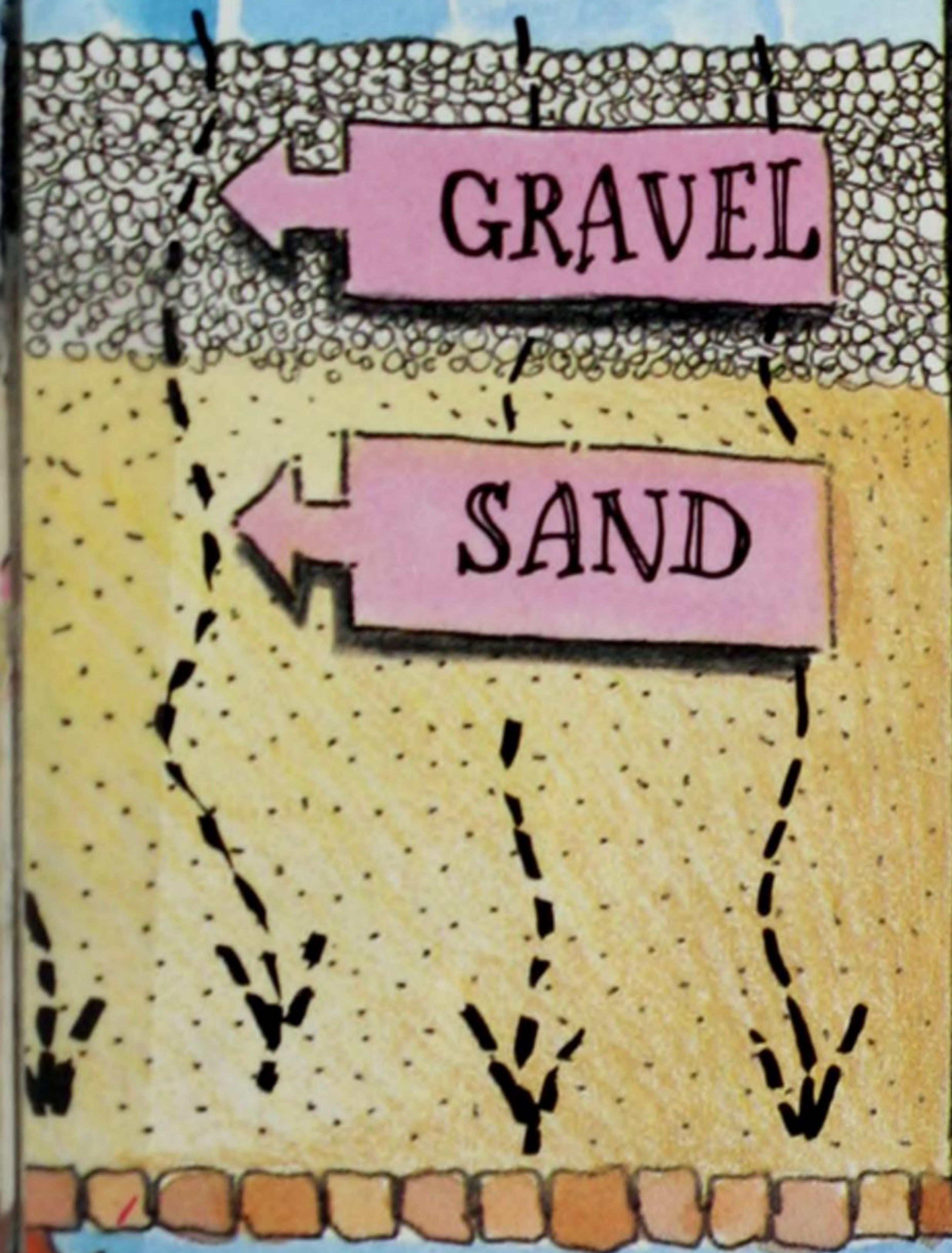
CLASS, THESE LAYERS OF SAND AND GRAVEL STRAIN OUT THE TINIEST BITS OF DIRT LEFT IN THE WATER-- EVEN MOST OF THE DISEASE GERMS.

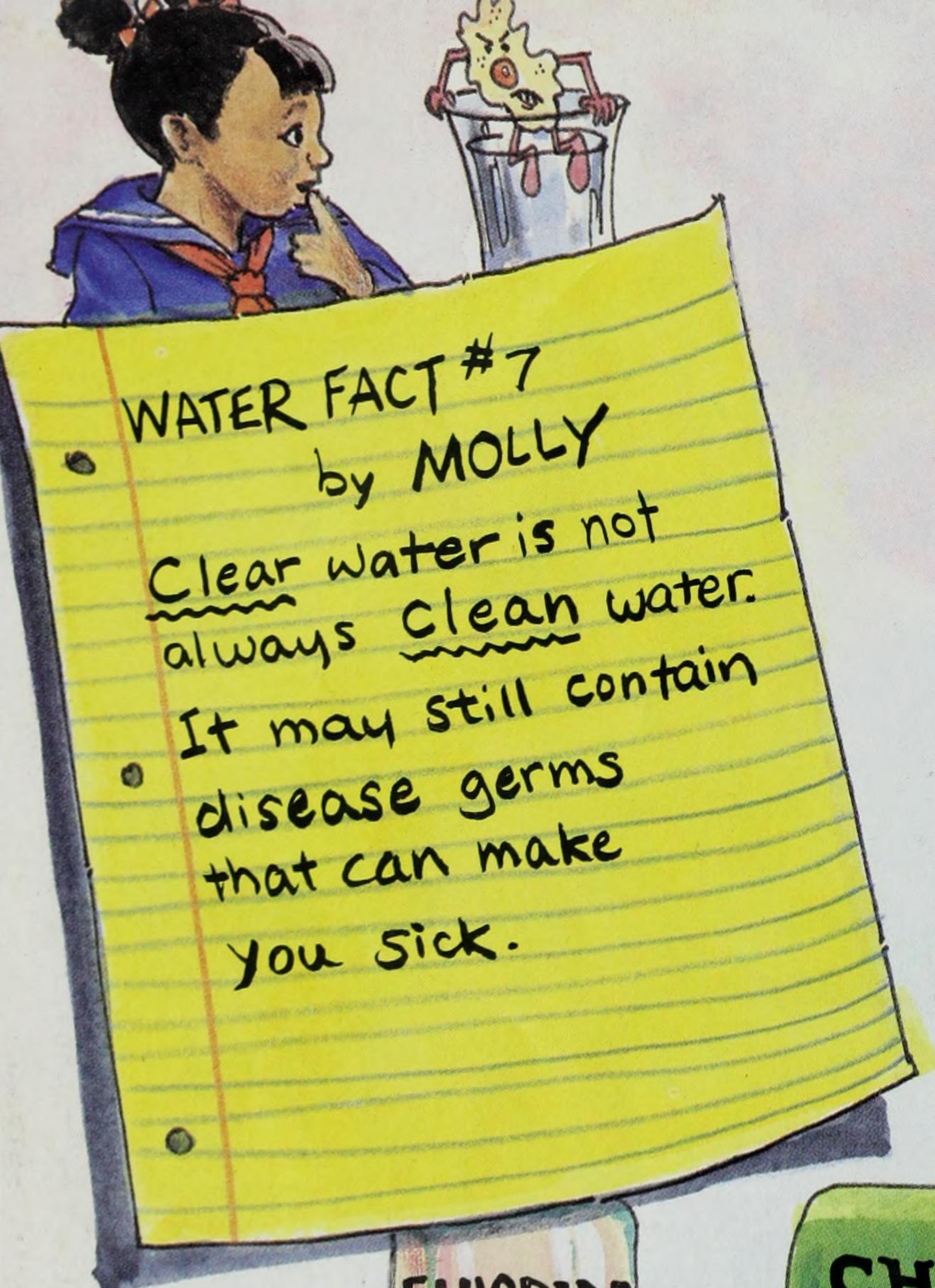
STILL ANOTHER WATER WORD

by Dorothy Ann

Impurities are dirt, dust, and disease germs -- anything that should not be in a glass of water.

I WOULD HATE TO FIND YOU IN A GLASS OF WATER.



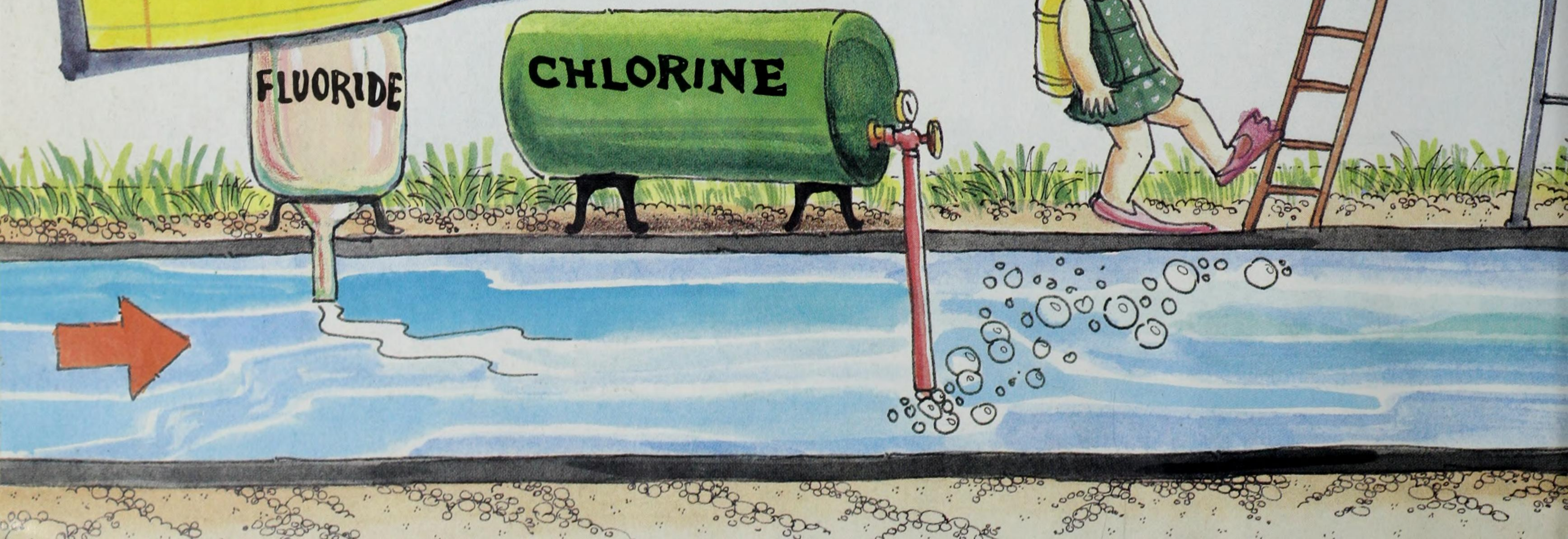


WATER FACT #7
by MOLLY

Clear water is not
always clean water.
It may still contain
disease germs
that can make
you sick.

In the pipe from the filter
to a storage tank, a chemical called
chlorine was added to the water.
Chlorine kills any remaining disease germs.
A trace of fluoride was also added
to keep kids from getting
so many cavities.

The water had come all the way
through the purification system.
We thought our class trip was over.
But Frizzie had other ideas.
“Everybody into the storage
tank,” she shouted.





Before we knew what was happening,
we were whooshed out of the
tank and into a pipe that
carries water to our city.

• **WATER FACT #8**
by Amanda Jane
The first pipes in
North America were
made of hollowed-out logs.
• Today pipes are made
of concrete, metal,
even plastic.



WHERE'S THE
BUS?



FOLLOW ME,
CLASS.



Then we went into water mains,
the pipes that run under
the city streets.

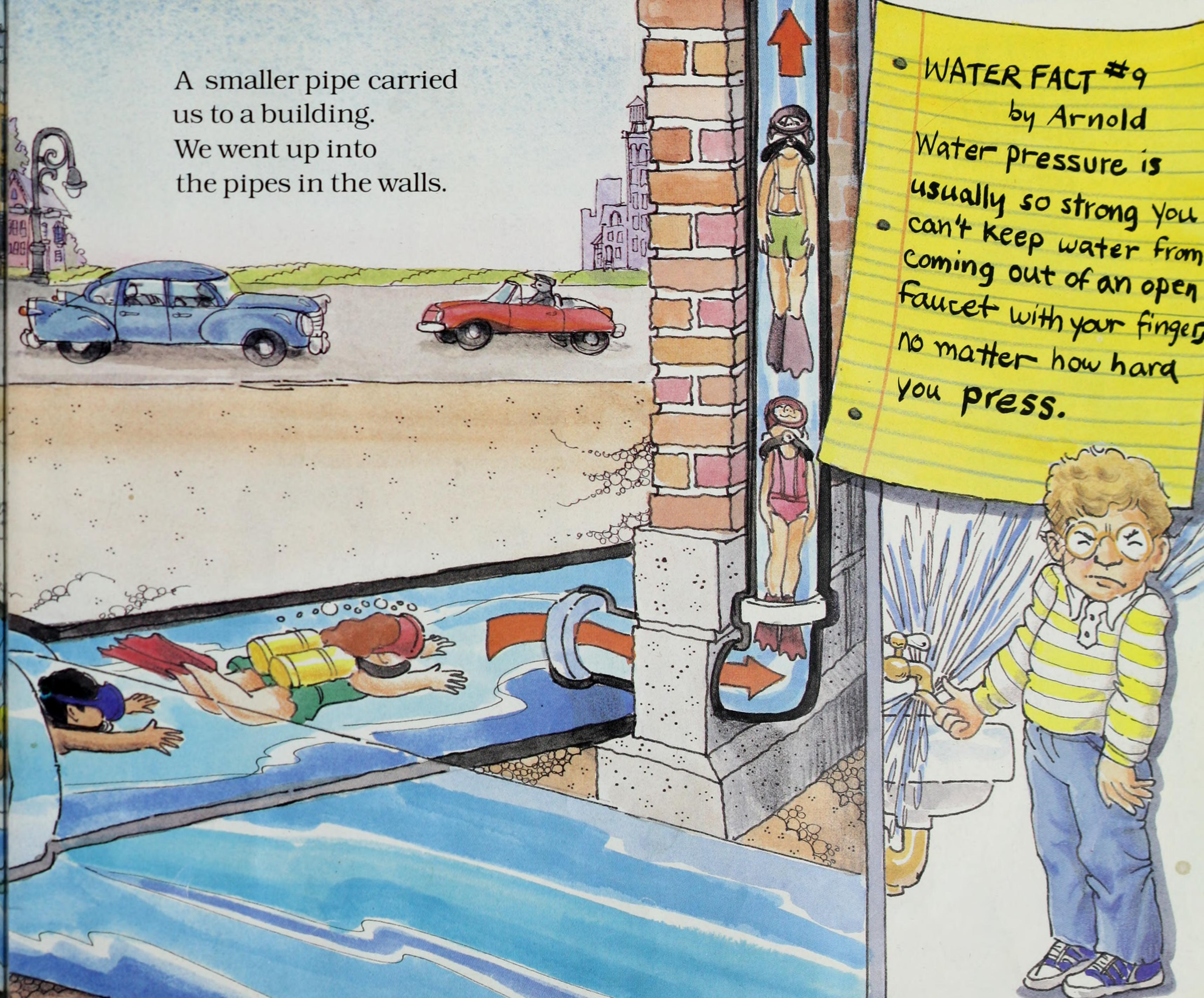


THE FORCE OF WATER
AS IT MOVES THROUGH
THE PIPES IS CALLED

WATER PRESSURE.

GO WITH THE FLOW, KIDS.

A smaller pipe carried
us to a building.
We went up into
the pipes in the walls.



- **WATER FACT #9**
by Arnold
Water pressure is
usually so strong you
can't keep water from
coming out of an open
faucet with your fingers
no matter how hard
you press.

EEEEK!

When a seventh-grader
turned on a faucet
in the girls' bathroom,
we came splashing out.
The building was our school!
We were back!
We were our regular size again!
We were dressed in normal clothes again!
(Except for Ms. Frizzle, of course.)



SAVE WATER!

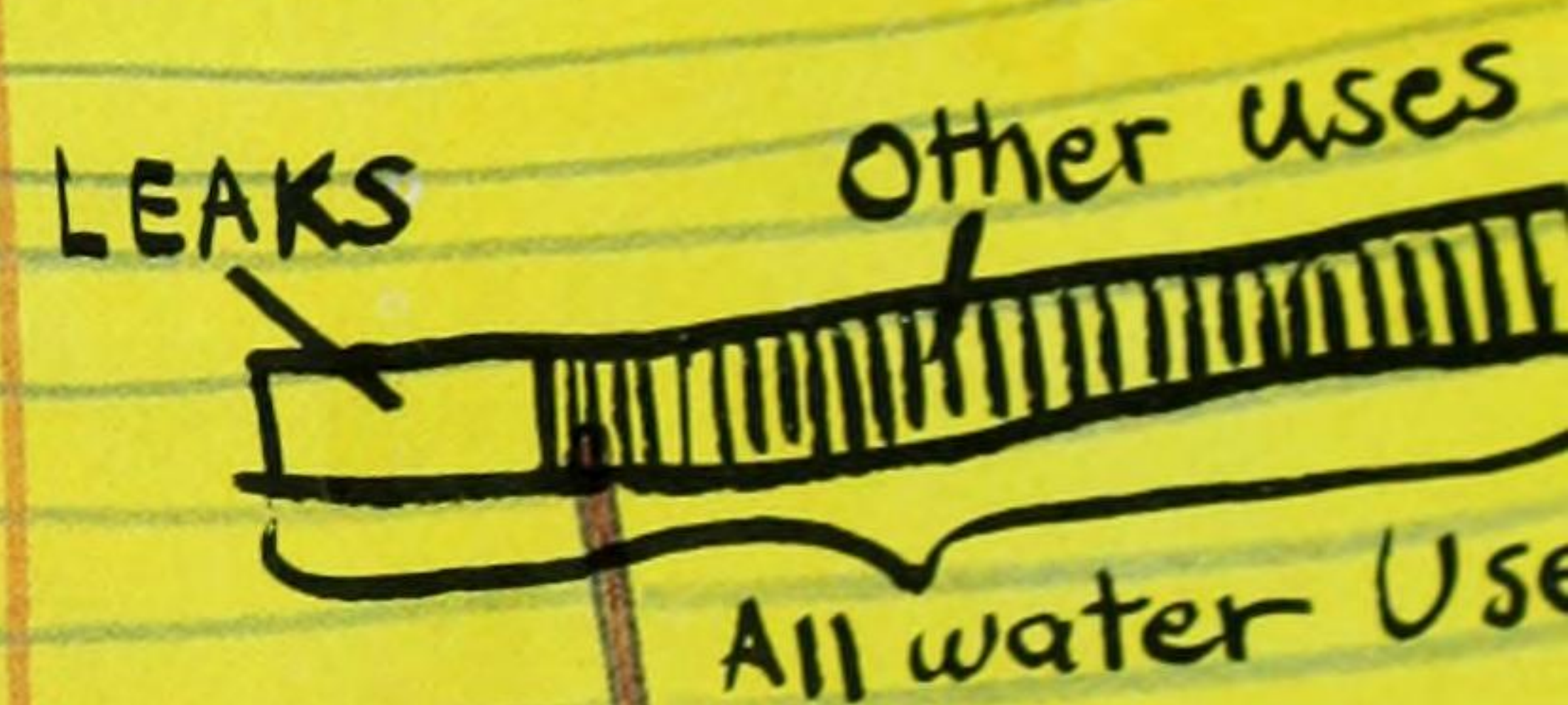
1. TURN OFF FAUCETS WHEN NOT USING.
2. PUT A WATER-SAVING DEVICE ON SHOWER HEAD.
3. FIX LEAKS RIGHT AWAY.

LINE UP,
CLASS.

WATER FACT #10

by John

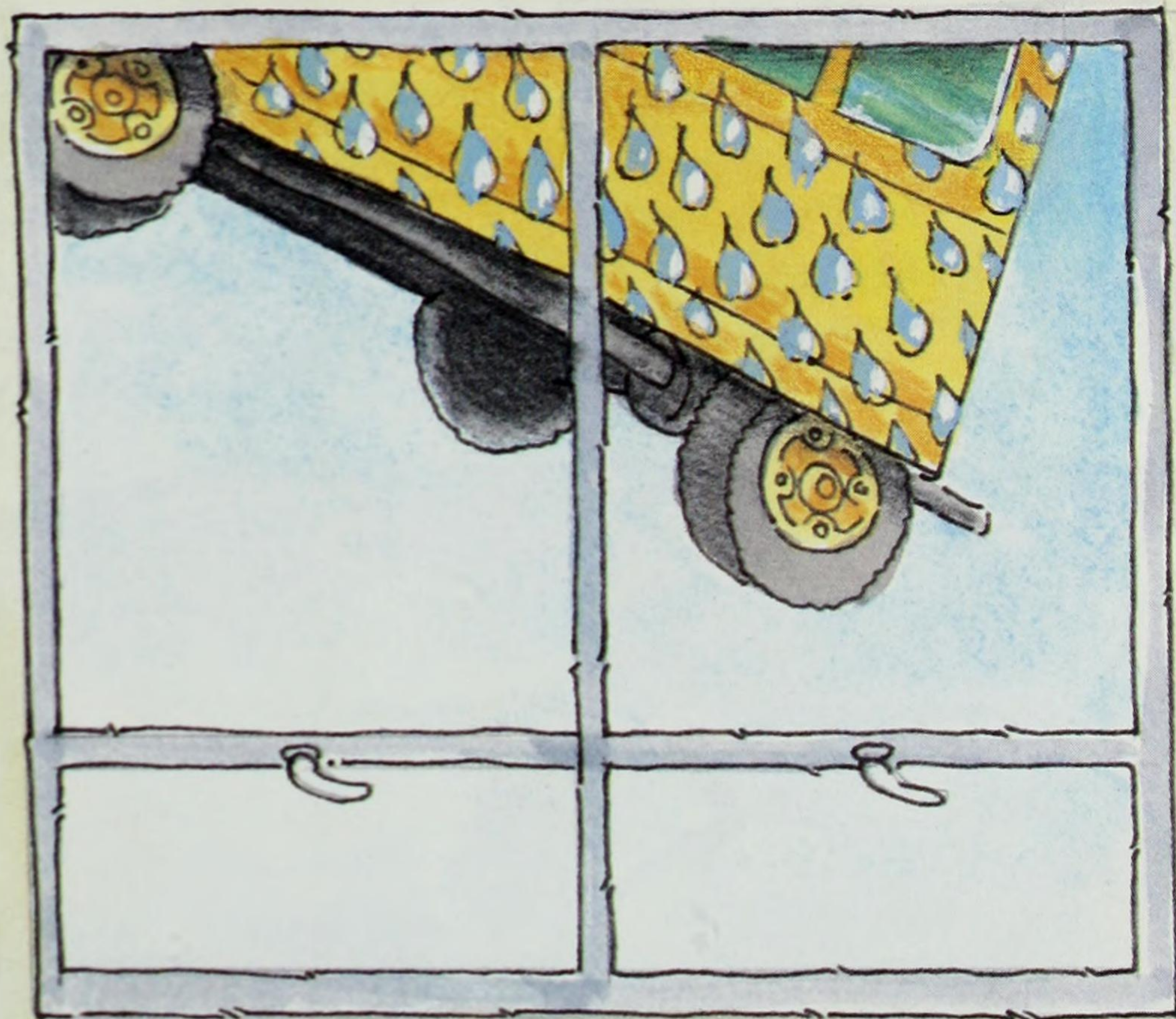
The average city in the United States loses about $\frac{1}{5}$ of all its water through leaks.



Back in the classroom,
Ms. Frizzle acted as if
nothing strange had happened.
She started feeding the class lizard.
And she put us to work right away.
We had to make a chart
showing how water gets
to the homes and buildings
in our city.

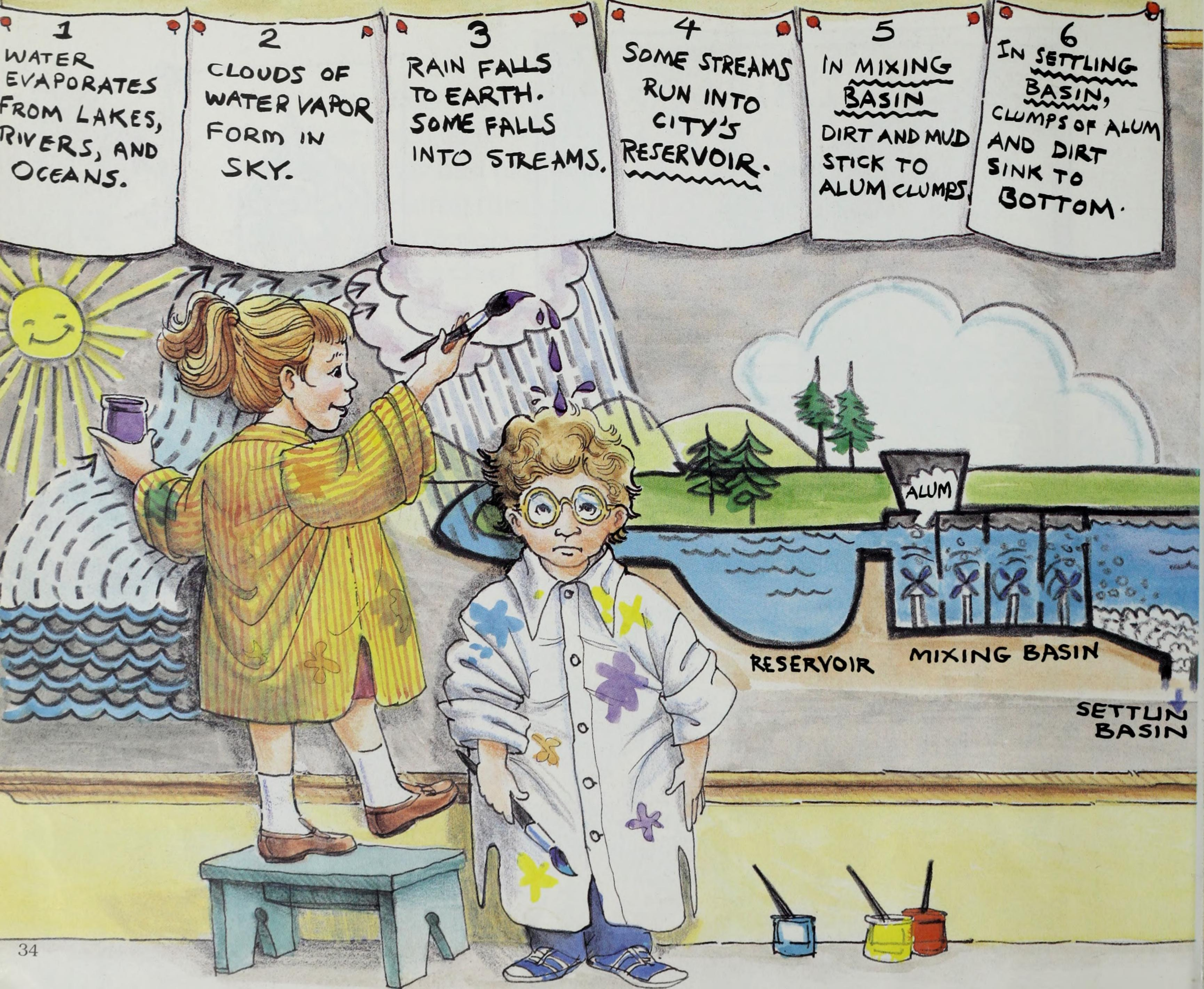
DOWN, GIRL.





When Arnold drew a picture of
a kid inside a raindrop,
Ms. Frizzle said,
“Where do you *get* these
crazy ideas, Arnold?”





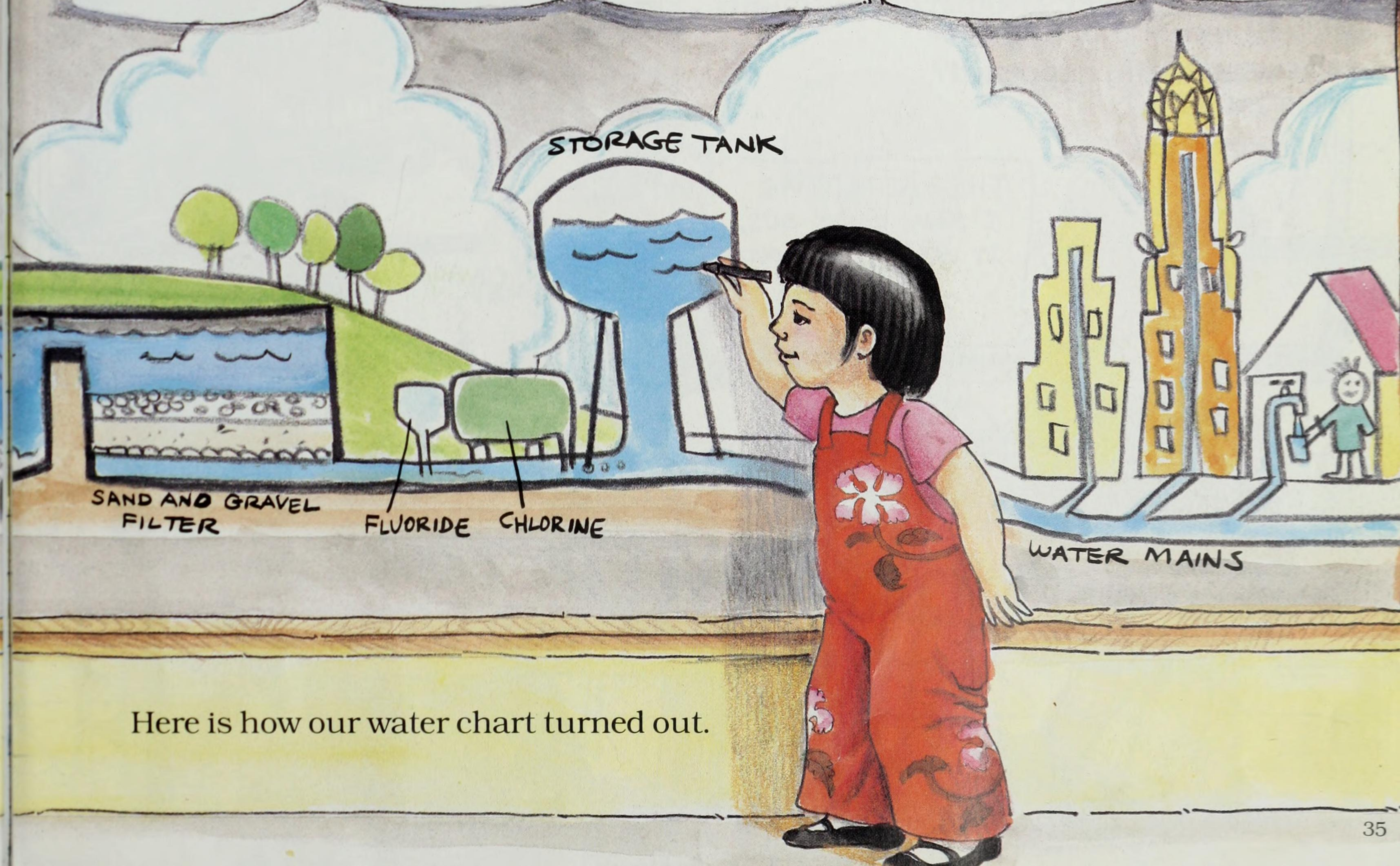
7
SAND-AND-
GRAVEL FILTER
TAKES OUT
LAST
IMPURITIES.

8
IN PIPE TO
STORAGE TANK
FLUORIDE IS ADDED
FOR STRONG TEETH.
CHLORINE IS
ADDED TO KILL
EVERY LAST
DISEASE GERM.

9
PURE WATER
IS HELD IN
A STORAGE
TANK.

10
WATER MAINS
CARRY WATER
UNDER CITY
STREETS...

11
...TO OUR
HOMES
AND
BUILDINGS.



Here is how our water chart turned out.

Later that day,
we saw the old bus
in the school parking lot.
How did *that* get there?
Did we only imagine going through
the water supply system?
Would we ever find out
what *really* happened?

THE LAST TIME
I SAW THAT BUS,
IT WAS IN A CLOUD
.... I THINK....



Ms. Frizzle says we'll be studying volcanos next.

This makes us all feel a little nervous! After all, with a teacher like Ms. Frizzle, *anything* can happen.



NOTES FROM THE AUTHOR (FOR *SERIOUS* STUDENTS ONLY)

The following notes are for serious students who do not like any kidding around when it comes to science facts. If you read these pages, you will be able to tell which facts in this book are true, and which were put in by the author as jokes. (This will also help you decide when to laugh while reading this book.)

On page 8: The green mold that grows on old bread is actually made up of tiny one-celled plants. It *cannot* talk or make any sound whatever.

On page 9: Plants do *not* have hands, *nor* do they wear sunglasses, and the soil does *not* contain burgers, fries, or shakes.

On page 13: Going through a dark tunnel will *not* cause you to wear a scuba diving outfit.

On pages 14-15: The force of gravity keeps a school bus firmly on the ground. It *cannot* rise into the air and enter a cloud, no matter how much you want to miss school that day.

On pages 16-31: Children *cannot* shrink and enter raindrops, fall into streams, or pass through the water purification system. And boys and girls *cannot* come out of the faucet in the girls' bathroom. (Anyone knows boys are not allowed in there.)

On pages 34-35: Your town or city may not get its water from a mountain reservoir, and the purification process may be slightly different from the one in this book. Many towns get water from rivers, lakes, or wells. Do you know where your water comes from and how it is purified?

On page 36: Once a bus is left behind in a cloud, it *cannot* suddenly appear in the school parking lot all by itself. Obviously, someone has to go back to the cloud and drive it home.





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